DOCUMENT RESUME

ED 044 035 EM 008 511

AUTHOR	Rogers, Everett M.
TITLE	Research Utilization in Rehabilitation.
INSTITUTION	Michigan State Univ., East Lansing. Dept. of Communication.
PUB DATE	Oct 70
NOTE	29p.; Paper presented at National Conference on the Psychological Aspects of Disability (Monterey, California, October 26-28, 1970)
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.55
DESCRIPTORS	Communication (Thought Transfer), Communication Problems, Reading Research, Research, Research and Development Centers, *Research Utilization, *Vocational Rehabilitation
IDENTIFIERS	BRIEFS, Bring Research Into Effective Focus

ABSTRACT

In terms of its attention to research utilization, vocational rehabilitation today may be where agriculture was in 1913. One reason for this is an inadequate understanding of the process of research utilization. Scattered studies of research utilization have occurred, but suffer from a lack of integration. Among propositions that may be postulated to attempt such an integration are these: (1) communication between the research system and client system is facilitated by a linking system; (2) communication of research results and/or client needs between a research system and a linking system is facilitated by the degree of homophily between researchers and linkers; and (3) the linking system depends upon homophily between researchers and linkers and between linkers and clients and the use of opinion leaders to bridge the heterophily gap. Research utilization may be improved by increasing the technical competence of clients, by attention to client feedback, by training organization managers to manage change, and by orientation of research to needs of practitioners. Further research is needed to determine the ideal structure for research utilization in vocational rehabilitation. Consolidation of vocational rehabilitation researchers in a small number of mission-oriented centers might be advisable. (MF)

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RESEARCH UTILIZATION IN REHABILITATION

by

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Paper presented at the National Conference on the Psychological Aspects of Disability, Monterey, California, October 26-28, 1970.

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RESEARCH UTILIZATION IN REHABILITATION*

by

Everett M. Rogers**

"Unapplied knowledge is knowledge shorn of its meaning."
(Alfred North Whitehead)

INTRODUCTION

For the past 16 years I have concentrated my research on the diffusion of innovations -- on how new ideas spread to U. S. farmers, to peasant villagers in less developed countries, and to high school teachers in Michigan and in Thailand. Throughout these inquires I sought to determine the communication channels through which these innovations spread, the characteristics of those individuals who adopted relatively earlier and relatively later, how the perceived attributes of the innovations affected their rate of adoption, the role of opinion leaders in diffusion, and why some change agents were more successful than others in securing the adoption of ideas by their clients.

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*The present paper is one in a progression dealing with the general problem of research utilization, and borrows, at places, from its ancestors, especially Rogers (1967) and Rogers and Jain (1969). All of this work profits heavily from the work of Professor Ronald Havelock (1969) at the University of Michigan, and from the writings of Professor Milton Coughenour (1968) at the University of Kentucky.

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In the last few years, I began to feel vague discomfort about this line of investigation. It seemed too restricted in many ways. For instance, I had assumed that the innovations I studied were "good", that they had desirable consequences for the individuals who adopted them. But I knew that my assumption was sometimes contrary to fact.

Further, the results of my studies seemed to help those in charge of diffusion campaigns, but to be of less usefulness, and occasionally of disadvantage, to the targets of these change programs. I was aiding the sources but not the receivers, agency executives and development planners but not peasants. And the ethics of this siding with the sources was often dismaying.

Worst of all, I seemed to be studying only a rather small piece of the action, while many of the important reasons for the human behavior I sought to explain lay beyond the specific boundaries of my inquiries. The diffusion of innovations, I came to realize, was a sub-process of a more ultimate, embracing system of communication through which new ideas were discovered and put into practice.

I presently see this "bigger picture" as an activity that I call research utlization, the process by which research results are produced in answer to client needs, and communicated to clients for their use. Diffusion is only one phase in this total process. The broader view of the problem has several advantages for both intellectual and practical purposes, as I shall expound in the present paper.

First, I shall describe the specific problem of research utilization in the case of vocational rehabilitation, and then return to the more general, and theoretical, task of analyzing the elements in the research utilization process.

THE PROBLEM OF RESEARCH UTILIZATION IN VOCATIONAL REHABILITATION

Imagine a potential communication system with 1,800 research reports on one end, and about 20,000 vocational rehabilitation counselors on the other. Between the two are numereus district, regional, state, and federal hierarchies, which constitute the administrative structure of a major goverment agency. One important problem is how the research results, as represented in the 1,800 publications, can most effectively be communicated to the couselors, who are the eventual consumers of the research findings. Until such innovations are put into practice, they represent an unrealized public investment. Until the practice of vocational rehabilitation is improved by such utilization, the research process is not complete.

The problem of research utilitzation can also be looked at from the opposite perspective: That of the potential user of research results. He encounters operational problems in the course of his daily activities, and often feels that knowledge of new alternatives might provide answers to his needs. Yet he often does not know how to obtain such information about new ideas (whether they eminate from researchers,

technical experts in his field, his administrative superiors, or peers), or how much credibility to place in such knowledge if he does receive it. So the communication problem, viewed from the "bottom-up" is how to obtain a maximum of relevant information with a minimum of searching effort.

Many individuals in various positions in vocational rehabilitation organizations appear to be inundated with a flood of printed messages, leading to a problem of information overload, defined later in the present paper. From this viewpoint, the communication problem is one of facilitating the filtering of more relevant from less relevant messages that can lead to improved operation of vocational rehabilitation agencies, and especially to those activities leading to appropriate change.

Leaders in the vocational rehabilitation field have recognized, in recent years, the importance of both the top-down and the bottom-up perspective in the process of communicating research results to practitioners .Among the activities designed to improve the efficiency of research utilization in rehabilitation are:

1. A 1966 conference, held in Miami Beach, on the theme: "Communication, Dissemination and Utilization of Rehabilitation Research Information."*

2. Creation of a task force in 1967-1968 in the Social and Rehabilitation Service on "Implementation of Research Utilization," which developed a series of recommendations about research utilization,

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*The results of this Conference are reported in a proceedings volume, Communication, Dissemination and Utilization of Rehabilitation Research Information, Washington, D.C. Social and Rehabilitation Service, Studies in Rehabilitation Counselor Training 5, 1967.

several of which have since been effectuated.

3. Creation and staffing of a new unit, the Research Utilization Branch, in the Division of Research and Demonstration Grants, Social and Rehabilitation Service, designed to facilitate research utilization.

4. Publication by the SRS Research Utilization Branch, of a series of synopses of research reports, called BRIEFS ("Bring Research Into Effective Focus"), designed to disseminate the results of vocational rehabilitation research to practitioners.

5. Establishment of a change agent position in the vocational rehabilitation structure on an experimental basis, called the Research Utilization Specialist (RUS), in 1968. His main role is to facilitate research utilization by practitioners, and to convey their research needs to researchers and research administrators. In 1970 there are about 15 of these RUS's in as many state vocational rehabilitation agencies.

All of these activities, and others, indicate the commitment of national leaders in the vocational rehabilitation field to maximizing research utilization. Yet these activities all suffer from a certain degree of uncertainty in their planning.* This frustration stems (1) from our lack of knowledge about the specific nature of research utilization in vocational rehabilitation, and (2) from our need for a

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*This statement is based, in part, on the present author's involvement in planning two of these activities.

more adequate and general conceptualization of the research utilization process*.

One reason for inadequate research utilization is our less-than-complete understanding of the nature of this process. Research utilization efforts will continue to be misguided until we gain, through research, more accurate and complete knowledge of the research utilization process.

I see research utilization as a promising field for future research, but one that badly needs clarification and synthesizing at the present time. We lack a clear understanding of just what the research problem is, a framework for analyzing it, and a propositional inventory that synthesizes what has been found, and what should be investigated. We begin our efforts in this direction with an explication of the concept of research utilization, and the main elements in the research utilization process.

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*There are parallel experiences with research utilization in other government agencies than vocational rehabilitation. Legislative committees question federal agencies as to how practice has changed as a result of previous research expenditures by the agency. Such frequently embarassing queries lead to increased attention by such agencies to research utilization activities. Examples of government organizations with recently-created research utilization sections are the Division of Practical Improvement, National Center for Educational Communications, of the U.S. Office of Education; the Office of Technology Utilization of NASA; the Applied Research Branch of NIMH; the Research Utilization Branch of the U.S. Office of Economic Opportunity's Community Action Program; and the State Technical Services Program of the U.S. Department of Commerce.

The most venerable research utilization program in the U.S., of course, is the Agricultural Extension Service, which has also served, at least implicitly, as the model for most other utilization programs. The Extension Service at the federal level is a part of the U.S. Department of Agriculture, but is mainly a function of state agricultural universities, whose local representatives (county extension agents) are assigned to counties. The federal legislation establishing the Agricultural Extension Service, the Smith-Lever Act, was passed in 1914.

ELEMENTS IN THE RESEARCH UTILIZATION PROCESS

Research utilization is the process by which research results are produced in answer to client needs, and communicated to clients for their use.* Thus, research utilization is a process: On-going, never-ending, flowing through time. As the case of any process, it is useful to heuristically "stop action" at discrete points in time to delineate stages or steps in this process. Figure 1 shows six of the important flows, and the three sub-systems, in this process.

The essential elements in the research utilization process include the three social systems depicted in Figure 1: (1) the research system, which creates and develops research results or innovations, (2) linking systems, which perform the function of translating client needs to researchers, and of diffusing innovations to clients, and (3) the client system, which recognizes needs for research and thus leads to its initiation, and which later adopts the innovations that may result.

Research utilization is not simply a one-way flow of client needs to researchers. Frequently, attempts at utilization have been source-oriented or message-oriented, rather than user-oriented. Unless we begin by considering the users' needs, his capability to receive and process messages, attempts at utilization are less likely to succeed.

User needs are difficult to assess. Some needs are salient and strongly felt. These may be ascertained by survey research studies of users, by user needs committees who are set up to advise the sources, or by linkers who have regular contact with large numbers of users.

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*We use "client" and "practitioner" as synonymous terms in the present paper, to indicate the ultimate user of research knowledge.

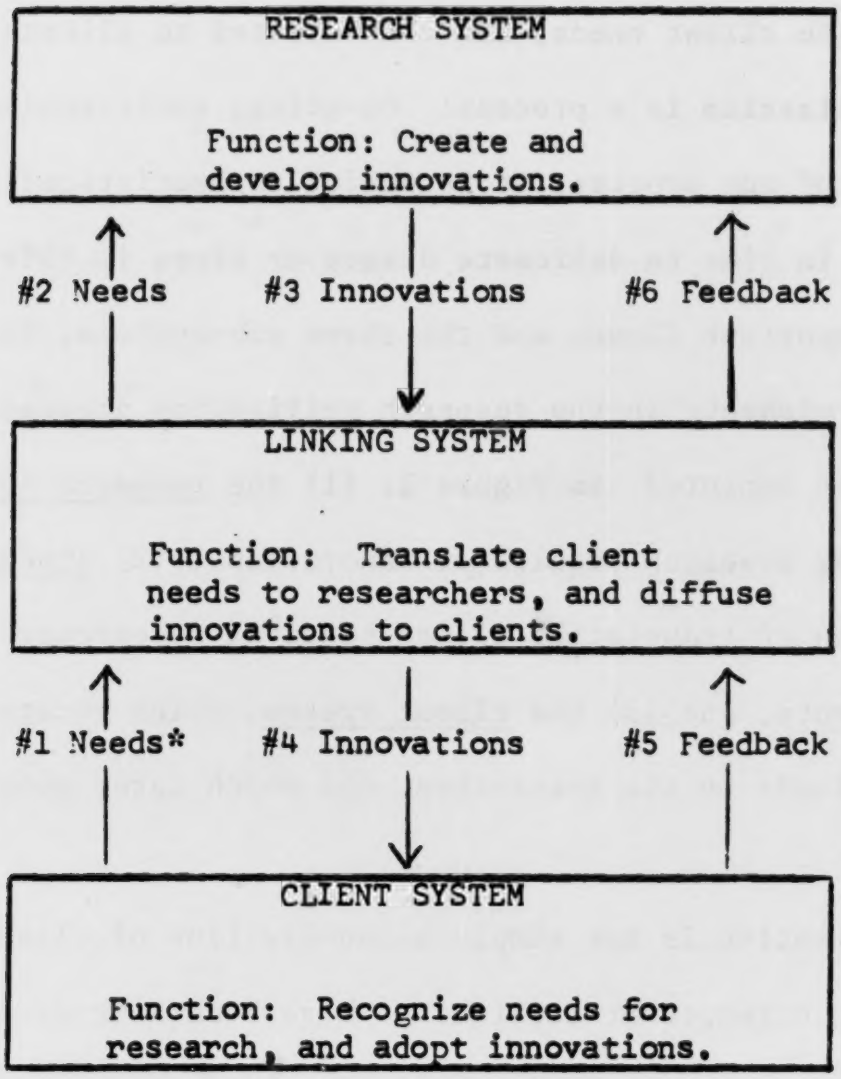

Figure 1. Paradigm of The Research Utilization Process.

*The communication flows numbered in this paradigm may be identified as follows:

#1 - Flow of user needs (for information) to linkers.
#2 - After interpretation and clarification, these needs are transferred to the research system.
#3 - Researchers attempt to provide needed information for users' needs, either from accumulated knowledge or via newly-originated research.
#4 - Linkers distill and interpret this new information (innovations) for users.
#5 - Feedback from users to linkers on the adequacy of the new information in meeting their needs.
#6 - Linkers convey users' feedback to researchers, perhaps leading to further user needs and recycling of the entire process.

Other user needs are of a deeper nature, and may be assessed only through delicate, sensitive probing over a period of time. Some needs are not recognized until certain new information is availavle. So the utilization process often acts to create new needs and to alter the priority of needs. Often, a user does not feel he needs an innovation until he knows of its existence.This sequential unfolding of user needs implies that need assessment should be a continuous process over time.

Most effective utilization systems have linkers as an intermediary between users and sources. Linkers are essential because (1) they can assess user needs, (2) they act as gatekeepers* between users and sources, allowing only the most relevant messages to pass, and (3) they bridge the heterophily gap between sources and users. Heterophily is the degree to which two or more individuals who interact differ in technical competence, education, socio-economic status, values and attitudes, etc. Frequently, the sources are technical experts in the subject matter being communicated, while the users are much less expert. The jargon, terminology, and interests of one cannot be understood by the other. An example is the case of information where the source is a Ph.D. psychologist and the user is a rehabilitation counselor. Unless some individuals play a linking role, effective communication between the two is unlikely or impossible.

Figure 1 shows (step #2) that user needs, after interpretation and clarification by the linker, are transferred to researchers. Thus, guidance for the sources as to what kinds of information and new knowledge to provide, should be based on user needs.

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*Gatekeepers are individuals who control the flow of messages through a channel.

If the sources presently possess the information needed by the users, they convey it directly to the linkers. If this information is not known, further analysis or research is necessary.

Often this information from the sources is in such technical form and there is so much of it, that the linker must condense, distill, interpret, and simplify it into a form that is digestible by the user. Unless this is done, the user will likely encounter a severe case of information overload, defined as an excess of inputs of information over what the user is able to process and utilize (Platt and Miller, 1969). This type of knowledge overkill is frequent in many fields today; the main problem is not one of a lack of information on the part of the user, but rather his inability to sort out of a mass of incoming messages those of higher relevance to him.

The main methods of coping with information overload in the utilization process are:

(1) Filtering of the messages by a linker, so that only selected, relevant information is presented to the user.

(2) Design the messages so that they are understandable by the user.

(3) Utilize appropriate, efficient communication channels; for instance, television is able to convey many more bits of information per minute than radio.

(4) Omit unnecessary details of the information when the message is produced.

Many sub-steps may be involved in step #4 (Figure 1) by which information is conveyed from the linker to the user: Field testing of the new idea, "test marketing", field demonstrations, etc. We must remember that the

client must be aided in adapting the innovation to his conditions, as most new ideas are applied to a somewhat different use than originally intended.

There is a return flow of messages from the user toward researchers, which constitutes feedback about the effectiveness with which user needs have been met by the information provided. Such feedback, after interpretation by the linkers to the researchers, offers a gradual approximation toward filling original client needs. Such feedback may disclose that these needs have not been fully met, or that new needs have been created or have been recognized.

Thus, the entire utilitzation process begins again.

This brief overview of the ideal utilization process highlights several common errors that are frequently encountered:

(1) The process does not begin with, or recognize, users' needs.

(2) Linkers are not provided in the process, or are not accorded much attention, perhaps because it is assumed that "good" information will sell itself to users.

(3) Users are inundated by an information overload.

(4) Little attention is paid to user feedback about the adequacy of the research utilization activities, so that the utilization agency rapidly becomes outdated and inapporpriate, rather than self renewing.

RESEARCH RELATED TO RESEARCH UTILIZATION

There are a least two communication research traditions which contribute to our present understanding and conceptualization of the research utilization

process: (1) scientific communication, and (2) the diffusion of innovations. Although studies of scientific communication have been going on in one form or another for at least 20 years (Paisley, 1965), most of the work has been done in the last decade*. The major focus of studies in scientific communication is upon the information-exchange behavior of researchers, especially the formal and informal communication channels, in explaining rates of scientific productivity (usually measured by publication records). The main concerns are summarized in five research themes by Menzel (1966): (1) acts of scientific communication constitute a system, (2) several channels may act synergistically to bring about the effective transmission of a message, (3) informal and unplanned communication channels play a crucial role in the science information system,** (4) scientists constitute publics, and (5) science information systems serve multiple functions.

The nature of scientific communication appears to be very highly specailized, as is the nature of science itself. For example, Price (1963) suggested that scientists communicate with each other in rather small-sized networks, which he dubbed "invisible colleges". Each invisible college consists of scientists who maintain a constant exchange of information in their specialty, but who are located in different organizations and perhaps even in different countries. A researcher's primary orientation is clearly to his scientific peers, rather than to a practitioners.

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*Somewhat representative of the work on scientific communication are Menzel (1966), Garvey and Griffith (1966), Parker and Paisley (1966), Crane (1969 and 1970), and the Committee on Scientific and Technical Communication of the National Academy of Sciences (1969).

**As the audience for formal channels is very restricted. Most scientific research is published in journals with highly specialized content. But journals reach very small audiences of fellow scientists, only about 200 readers for the average article in the psychological literature (Garvey and Griffith, 1964).

In terms of our paradigm of elements involved in the research utilization process, scientific communication deals mainly with intra-system communication among researchers. There is very little attention to the communication of research results to linkers and clients.

The diffusion of innovation approach is represented in about 1,800 research reports, each of which is concerned with how new ideas spread via certain communication channels to the members of social system over time (Rogers with Shoemaker, 1970). So diffusion research has investigated the "downward" flows of research results (Figure 1) from scientist to practitioner. Diffusion and research utilization are not synonymous on two counts (1) the "upward" flow of research needs from clients to researchers is not generally studied by diffusion researchers, (2) there are many new ideas that do not represent research results. So the diffusion research tradition is concerned with knowledge utilization (a somewhat broader field than research utilization) in which the new ideas originate from clients' experience, from our general fund of expert knowledge, or from world happenings, as well as from research.

Further, the main emphasis in diffusion research is only upon communication patterns among clients (plus slight attention to the communication of innovations from linking agents to clients). So both scientific communication and diffusion are mainly concerned with intra-system communication flows while largely ignoring the inter-systemic flows involved in research utilization.*

RESEARCH ON RESEARCH UTILIZATION

In very recent years, research designed to probe the nature of research utilization itself has been conducted.

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*A recent, impressive exception to this statement is Lionberger and Chang (1970), who trace the inter-systemic communication flows among research, extension, and user systems in Taiwan agriculture.

1. Some of these inquiries seek to describe the research utilization process by tracing research results among at least two or more of the three main systems in the research utilization process. Examples of these flow-tracing studies are: (1) a study of 10 educational innovations as they spread through the hierarchy of the Thai Ministry of Education to local secondary school teachers (Rogers and others, 1968 and 1969); (2) Goldin and others' (1969) study of the use of two research reports; (3) Glaser's (1969) analysis of the relative utilization of ten research projects; and (4) a discussion of problems in the utilization of psychological research on learning (Mackie and Christiansen, 1967).

Although the yield of the flow-tracing studies helps to provide a description of the nature of research utilization in some fields, we yet lack a very complete picture of the total process. We need studies in which the entire cycle of research utilization is described, by tracing a specific innovation or innovations from clients' needs, to research, through linkers, to clients, etc. This has not yet been done, and should be. Innovations make excellent tracers in the sense that they seem to leave deep scratches on men's minds, and facilitate respondent recall of information about the process.

2. Field experiments designed to evaluate methods or strategies of speeding up the research utilization process have also been conducted. An example is Glaser's (1967) investigation of the effect of client conferences on the adoption of a vocational rehabilitation innovation.

3. Yet a third type of research on research utilization is of a comparative-descriptive nature. In this approach, two or more different

research utilization systems are analyzed and compared. For example, Havelock and others (1969) compare and contrast linking systems in agriculture, education, medicine, etc., in order to derive general strategies for effective research utilization. In a somewhat parallel sense, two research utilization systems in the same field could be compared, so as to determine reasons for greater relative effectiveness.*

PROPOSITIONS ABOUT RESEARCH UTILIZATION

Both the findings (1) in the two related-but-different fields of scientific communication and diffusion of innovations and (2) in the few and scattered studies of research utilization itself, suffer from a lack of integration and synthesis. The remainder of this paper offers a series of propositions about research utilization which represent a first attempt in the direction of synthesizing the field.** Some propositions are <u>generalizations</u> in that they are backed by research evidence; most are <u>hypotheses</u> in that they have logical support but little empirical backing. So our main emphasis here is upon what is not yet known, but should be.

Linking Systems

One of the most fundamental propositions (almost an assumption) about research utilization is that linking systems are needed. Proposition #1 states that: <u>Communication between the research system and client system</u>

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*In one sense, the Lionberger and Chang (1970) study, mentioned earlier, illustrates this comparative approach in that the U.S. model of agricultural extension is contrasted with the Taiwanese counterpart.

**For illustrations of propositional inventories in related fields, see (1) Rogers with Shoemaker (1970), who present 103 propositions about the diffusion of innovations, (2) Rogers and Bhowmik (1969), who synthesize and Guetzkow (1964), who inventory propostions about small group decision-making, (4) March and Simon (1958), who follow a similar procedure for formal organizations, and (5) Price (1968), who details propositions about organizational effectiveness.

is facilitated by a linking system between them.

As pointed out previously, linkers can facilitate a two-way flow of communication between researchers and clients. The popular, erroneous conception of research utilization is of a one-way, researcher-to-client communication process. But we argued earlier in this paper that research utilization is a continuous, cyclical process, that can only be heuristically partitioned in a chicken-and-egg sense. If there is any likely starting point for the process, it should be with clients' needs, rather than with researchers' activities. However, the most frequent image of the role of research utilization is when we already have an innovation (like modern math, hybrid corn, auto seat belts, etc.), and we wish to speed the diffusion of this research result into client adoption. This is only a very partial view of the research utilization process, and one that is highly inefficient if our ultimate goal is to maximize the utilization of research results. A basic reason for the lack of research utilization is that the process is often begun with the research process, rather than with clients' needs. We start with an answer, not a question. This is a source-orientation, rather than a receiver-orientation, a most frequent and fundamental error in communication, one that seriously impedes the effectiveness of our communication attempts.

This overemphasis upon the source's, rather than the receiver's, viewpoint not only occurs in the operation of research utilization agencies (that is, linking systems), but also in the focus of research on research utilization. These studies are mainly conducted for the immediate usefulness of the research system or the linking system, and seldom for the direct

benefit of the clients or the practitioners.* Perhaps this is due (1) to the sponsorship of research utilization (more often by the research or linking system, rather than by the clients), and (2) to the greater similarity of research utilization researchers with other researchers and linkers, than with clients. Thus, there is an implicit bias in research utilization research that tends (1) to favor the researcher and linker and to yield them a manipulative potential over the client, and (2) to continue our distorted, source-oriented image of the research utilization process, a false image which leads to inefficiencies in research utilization.

We have learned that good ideas do not sell themselves, at least very quickly or directly. Linkers are needed. And vocational rehabilitation offers a novel opportunity to test Proposition #1 about the effects of linkers. Because the RUS is a new role, and only found in about a dozen state rehabilitation organizations at present, its consequences in facilitating two=way comminication could be empirically tested. But such evaluation-type research has not yet been clearly conceptualized, nor actually planned. And the opportunity for investigating the actual role performance of RUS linkers, and their prototypic potential, will soon pass.**

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*We earlier noted an assumption in most research utilization publications that the innovations should be adopted by the clients, that the rate of adoption should be speeded up, etc. Seldom is it implied that the source or linking systems, or the communication channels, may be at fault for not providing more adequate information, for promoting inadequate or inappropriate innovations, etc. The source-bias in research utilization research may have a close counterpart in other fields of communication research. Persuasion research is seemingly conducted for the benefit of the persuader rather than the persuaded, modernization research for change agents and planners rather than peasants, etc.

**A parallel opportunity for assessing the performance of linkers is now present in public education where the U.S. Office of Education established two "field agent" positions (patterned after the vocational rehabilitation RUS's) in each of three state departments of education. Fortunately, research on these linker teams is incorporated as one ingredient in their experimental introduction.

Effective research utilization requires a linking system, which may be much more than just a number of individual linkers. The system usually must include an orgaizational structure in which the linker is embedded, as the agricultural extension service is the organization in which the county agent functions. The linkers' organization may have formal relationships with the research system and with the client system.

Because most research utilization occurs in an organizational setting, much of research utilization represents a problem in organizational communication. Such concepts as horizontal and vertical channels, distortion, information overload, and conflict may be useful in investigating communication flows between clients, linkers, and researchers.

There is one alternative to creating linkage systems in a formal organizational format: The temporary linkage team. Such teams have been utilized in other fields, such as military industries and space, but not in vocational rehabilitation, other than in the form of occasional consultants. The special advantage of the linkage team, often composed of experts in several fields bearing on a problem (such as a social psychologist, medical doctor, and an engineer), is that they can act on specific client needs, and without the possible encumbrance of lasting formal structure. However, the temporary team cannot ensure the continuous flow of client needs to researchers, innovations to clients, and feedback to this process, which we feel are essential to really effective research utilization.

Proposition #1 implies that we should try to direct research attention to questions such as: What factors affect the two-way flow of information (through linkers) between the research system and the client system? What motivates a researcher to seek client needs (through linkers) and gear his research work to match these needs? What factors affect the motivation

of researchers to communicate research results directly to clients, rather than via linkers?

Researcher-Linker Heterophily

If there are linking roles interposed between researchers and clients in a given field, what factors affect the effectiveness of communication between researchers and the linkers? Homophily is the degree to which pairs of individuals who interact are similar in certain attributes (such as education, technical expertise, etc.). As defined earlier in this paper, heterophily, the opposite of homophily, is the degree to which pairs of individuals who interact are different in certain attributes.

Communication is more effective when the source and receiver are homophilous rather than heterophilous on certain attributes.* When the source and receiver have similar beliefs and values, share a common language, and have similar experiences, they are more likely to share common meanings of the messages exchanged between them, resulting in more effective communication. On the other hand, interaction among those who are quite dissimilar is likely to cause misperceptions, message distortion, and restricted channels of communication, resulting in ineffective communication.

We summarize the above discussion in Proposition #2: <u>The effectiveness of communicating research results and/or client needs between a research system and a linking system is facilitated by the degree of homophily between researchers and linkers</u>.

We need to find out via future researches: What are the most important attributes or dimensions on which a researcher and linker should be homophilous

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*For instance, see Rogers with Svenning (1969) for evidence on this point. For a series of propositions about homophily-heterophily in communication, see Rogers and Bhowmik (1969).

for effective communication to occur? Are there optimum combinations of homophily and heterophily on different variables for most effective communication between researchers and linkers? There would be implications from such data as these for the training and selection of linkers.

Linker-Client Heterophily

There is an obvious counterpart to Proposition #2 at the level of linkers and clients. Proposition #3 is that: The effectiveness of communicating research results and/or client needs between a linking system and a client system is facilitated by the degree of homophily between linkers and clients.

Support for this proposition is provided by research evidence that the more "successful" change agents are those who are most like their average client. For instance, village-level change agents in India with only an elementary education are more effective in reaching villagers (who are mostly illiterate) than are change agents with high school or university education.

Earlier, it was pointed out that researchers are necessarily heterophilous with linkers in respect to competence in their specialty.* Likewise, linkers are more competent than their clients with respect to the research results or innovations they are trying to diffuse. Such heterophily leads often to ineffective communication between a linker and his clients, and contributes to the failure of many diffusion campaigns (Rogers and Bhowmik, 1969).

One way to overcome this problem is through the use of opinion leaders as intermediaries between a change agent and his audience. Opinion leaders are individuals who informally influence others' attitudes or overt behavior

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*In fact, Propositions #2 and #3 are partially antagonistic in the sense that greater researcher-linker homophily in technical competence necessarily leads to greater linker-client heterophily in this dimension.

in a desired way with relative frequency. There is research evidence that opinion leaders tend to be more cosmopolite, more change-oriented, more exposed to mass media channels, and higher in social status, than other members of their system. Yet the leaders cannot be too much different from the average member of their system if they are to be effective. Opinion leaders are used by change agents to reach their more heterophilous clients, so that the heterophily gap can be halved. Thus, we postulate Proposition #4: The effectiveness of communicating research results and/or client needs between a linking system and a client system is facilitated by opinion leaders who bridge the heterophily gap between linkers and clients.

There are patterns of opinion leadership among rehabilitation counselors, for instance, and such leaders could aid linker-client dialogue. We need to know how to identify such opinion leaders, and how they could be involoved in research utilization efforts.

There is an alternative to opinion leaders in bridging the linker-client heterophily gap. That alternative is to raise the level of client technical competence, so that the linkers and the clients are more homophilous. In the field of vocational rehabilitation, for instance, one could imagine a series of inservice training institutes designed to increase counselor competence in how to understand research reports, in the process of change, in how to identify needs for new knowledge, and in the nature of vocational rehabilitation innovations that appear promising. Essentially, this training is designed to make counselors (that is, practitioners) their own linkers, at least to some extent.

To summarize, Proposition #5 states: The effectiveness of communicating research results and/or client needs between a linking system and a client

system is facilitated by increasing the technical competence of clients, so that linker-client heterophily is decreased.

When a source-receiver pair is hetrophilous, feedback is especially important for effective communication. Through attending to feedback, the source may gain information about his receivers, and thus will become more effective in his communicative efforts with heterophilous clients. So we propose Proposition #6: The effectiveness of communicating research results and/or client needs is facilitated by the degree to which researchers and linkers make use of feedback from clients.

This proposition thus tests one aspect of our research utilization paradigm (Figure 1), that feedback flows #5 and #6 are important in improving the effectiveness of the utilization process.

Managing Change

When innovations are introduced in any formal organization, like a vocational rehabilitation agency, they lead to changes in the functioning and the structure of the organization. Unfortunately, the formal leaders or executives of most such organizations are oriented mainly to managing for maintenance or stability, rather than managing change. So the administrators of client systems in vocational rehabilitation need training in the process of change, in the nature of the research utilization process, and how to lead their organizations toward appropriate change and self-renewal. Thus, managers can, and should, perform some of the functions of a linker. These managers possess formal power and means of control; these resources can be a strong force for change, rather than a resistance to new ideas, as is often the present case.

We summarize this approach in Proposition #7 The effectiveness of research, utilization efforts is increased by training organization managers in methods of managing change.

Reorienting Research toward Utilization

Fundamental to our present essay is the assumption that a major reorientation in the nature of vocational rehabilitation will be necessary to maximize its utilization. We have already said that the direction for future research should be at least partly determined by practitoners' needs.

Further, it may be necessary to alter the reward system for researchers, so as to encourage application. At present, there seems to be little reward, and some degree of punishment, for researchers who lean toward utilization of their results by practitioners. The norms of science favor new knowledge for its own sake. And there are often some good reasons for divorcing research from practice, if one mainly wants to maximize the productivity of research.

The U.S. military establishment, for example, has taken a lesson from the case of Colonel Billy Mitchell, who in pre-World War II days advocated bombing as an important tool of modern warfare. His courts martial charge was essentially based on his desire to design a new type of military system, an innovation strongly resisted by military leaders with a vested interest in existing fighting systems. The U.S. military have since separated research from operations, so as to provide the freedom for researchers to create and design new military systems. These innovations flow to the chief military executives, and perhaps through them to operational military commands.

Perhaps such separation of the research system from practice is justified in certain fields. But in vocational rehabilitation we feel a closer connection between the two systems is needed, at least if research utilization is to be increased. Such client-researcher interrelatedness can often be accopmlished without seriously distrubing scientific productivity.

For instance, it might be advisable to consolidate the researchers in a small number of mission-oriented centers, each responsible for conducting research in a specialized area of vocational rehabilitation. Each center would have adequate funds, the time and continuity, and the linkage with practice to make its product significant, relevant, and useful. The concentration of the specialized researchers facilitates (1) their informal scientific communication, so that they constitute a contiguous "invisible college", and (2) their liason with practitioners. The center might also "package" its knowledge in useful forms for linkersto transmit to practitioners, in much the same way that the U.S. Office of Education is currently packaging knowledge in such areas as the teaching of reading, behavior modification, etc.

Such an approach would be a sharp contrast to the current research organization in vocational rehabilitation, where an individual project-and-report is the basic unit. There are much more effective styles of structuring research if one's main goal is utilization.

Proposition #8 is that: <u>Research utilization is increased by orienting research activities toward the needs of practitioners</u>.

QUO VADIS?

In terms of its attention to research utilization, vocational

rehabilitation today may be about where agriculture was in 1913.*
The next year, 1914, saw the beginnings of a large-sclae research utilization system, the extension service, but another decade was required for the system to operate very effectively. In 1913, there had been 25 years of agricultural research, but few of its results had reached any farmers. The users had needs and problems, the researchers had new knowledge, but attempts to link the two had been disorganized and scattered.

We have learned much about the nature of research utilization from the relatively successful case of agriculture, and some of these understandings can be applied to such human behavioral modification fields as education, vocational rehabilitation, and mental health. But social science research yields quite a different product than biological or physical science research, and we must be properly cautious about applying the lessons of research utilization from the military, space, or agriculture fields.

The final answer as to the ideal structure and operation of research utilization in vocational rehabilitation needs to come from further research and experimentation on research utilization. And I feel we have made but a first step in the long journey.

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*The equally inadequate state of research utilization in U.S. education was recently described by Chase (1968): "It exhibits a low capacity for generating new knowledge; its development is not closely linked to research; and its practitioners receive inadequate help in translating substantive, theoretical, and technological knowledge into educational operations".

REFERENCES CITED

Francis S. Chase (1969), "Educational Research and Development: Promise or Mirage?" Journal of Research and Development in Education, 1: 3-14.

Barry E. Collins and Harold Guetzkow (1964), A Social Psychology of Group Processes for Decision-Making, New York, Wiley.

Committee on Scientific and Technical Communication of the National Academy of Sciences (1969), Scientific and Technical Communication: A Pressing National Problem and Recommendations for Its Solution, Washington, D.C., National Academy of Sciences, Report.

C. Milton Coughenour (1968), "Some General Problems in Diffusion from the Perspective of the Theory of Social Action, "in North Central Regional Subcommittee for the Study of Diffusion of Farm Practices, Diffusion Research Needs, Columbia, University of Missouri Agricultural Experiment Station, North Central Regional Research Bulletin 186.

Diana Crane (1969), Social Structure in a Group of Scientists: A Test of the "Invisible College" Hypotheses, "American Sociological Review, 34:335-352.

Diana Crane (1970), "The Nature of Scientific Communication and Influence," International Social Science Journal, 22: 28-41.

William D. Garvey and Belver C. Griffith (1964), "Scientific Information Exchange in Psychology," Science, 146: 1955-1959.

Edward M. Glaser (1967), Utilization of Applicable Research and Demonstration Results, Los Angeles, Human Interaction Research Institute, Mimeo Report

Edward M. Glaser (1969), Factors Influencing the Success of Applied Research: A Study of Ten NIMH-Funded Projects, Los Angeles, Human Interaction Research Institute, Mimeo Report.

George J. Goldin and others (1969), The Utilization of Rehabilitation Research: Concepts, Principles, and Research, Boston, Northeastern University, New England Rehabilitation Institute Monograph 6.

Ronald Havelock and other (1969), Planning for Innovation through Dissemination and Utilization of Knowledge, Ann Arbor, University of Michigan, Center for Research on Utilization of Scientific Knowledge, Report.

Herbert F. Lionberger and H.C. Chang (1970), Farm Information for Modernizing Agriculture: The Taiwan System, New York, Praeger.

Robert R. Mackie and Paul R. Christiansen (1967), Translation and Application of Psychological Research, Goleta, California, Human Factors Research, Report

James G. March and Herbert A. Simon (1958), Organizations, New York, Wiley.

Herbert Menzel (1966), "Scientific Communication: Five Themes from Social Science Research", American Psychologist, 21.

William J. Paisley (1965), The Flow of (Behavioral) Sciences Information: A Review of the Research Literature, Stanford, California, Stanford University, Institute for Communication Research, Mimeo Report.

E. B. Parker and W. J. Paisley (1966), "Research for Psychologists at the Interface of the Scientist and His Information System," American Psychologist, 21: 1061-1071.

John Platt and J. G. Miller (1969), "Handling Information Overload," Ekistics, 28: 295-296.

Derek J. De Solla Price (1963), Little Science, Big Science, New York, Columbia University Press.

James L. Price (1968), Organizational Effectiveness: An Inventory of Propositions, Homewood, Illinois, Irwin.

Everett M. Rogers (1967), "The Diffusion of Vocational Rehabilitation Innovations," in Communication, Dissemination and Utilization of Rehabilitation Research Information, Washington, D. C., Social and Rehabilitation Service, Studies in Rehabilitation Counselor Training 5.

Everett M. Rogers and Dilip K. Bhowmik (1969), "Homophily-Heterophily: A Call for Relational Analysis in Communication Research," Paper presented at the Association for Education in Journalism, Berkeley, California.

Everett M. Rogers and Nemi C. Jain (1969), "Research Utilization: Bridging the Communication Gap between Science and Practice," Paper presented at the Joint Session of the Information Systems Division of the International Communication Association and the Behavioral Sciences Interest Group of the Speech Association of America, New York.

Everett M. Rogers with F. Floyd Shoemaker (1970), Communication of Innovations: A Cross-Cultural Approach, New York, Free Press of Glencoe.

Everett M. Rogers with Lynne Svenning (1969), Modernization Among Peasants: The Impact of Communication, New York, Holt, Rinehart and Winston.

Everett M. Rogers and others (1968), The Diffusion of Educational Innovations in the Government Secondary Schools of Thailand, East Lansing, Michigan State University, Institute for International Studies in Education, Education in Thailand Publication 5.

Everett M. Rogers and others (1969), Diffusion of Innovations: Educational Change in Thai Government Secondary Schools, East Lansing, Michigan State University, Institute for International Studies in Education and Department of Communication, Mimeo Report.